A COMPARISON OF THE CONTENTS OF SELECTED BSCS AND TRADITIONAL TEXTBOOKS

by

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TABLE OF CONTENTS

PAGE

INTRODUCTION. 1

  Statement of the Problem. 2

  Significance of the Problem 3

  Assumptions and Limitations 3

  Definition of Terms 4

    Content 4

    BSCS. 4

    Traditional or conventional 4

LITERATURE REVIEW 5

  Teacher Preparation 6

  Textbooks 7

  Textbook Evaluation 8

DESIGN OF THE STUDY 11

PRESENTATION OF DATA. 12

SUMMARY AND CONCLUSIONS 20

BIBLIOGRAPHY. 23

LIST OF TABLES

TABLE PAGE

I. Topics Related to Biology: Its Approach and History. . . . 13

II. Topics Related to Ecology 13

III. Topics Related to Microorganisms. 14

IV. Topics Related to Flowerless Plants 14

V. Topics Related to Flowering Plants. 15

VI. Topics Related to Animals 17

VII. Topics Related to Heredity and Evolution. 19

VIII. Content in the BSCS Yellow Version and Modern Biology . . . 20

INTRODUCTION

"In 1955 an Education and Professional Recruitment Committee was appointed by the American Institute of Biological Sciences and charged with the development of a program of biological education at all school levels. It was proposed that a comprehensive curriculum project be developed to include new course content, laboratory manuals, and teacher aids; the production of films, film strips, charts and models; a study of present in-service training of teachers; and the possible production of pamphlets, booklets, and other publications that may serve to increase the effectiveness of biological education."[1] On the recommendation of that committee, the Biological Sciences Curriculum Study Group (BSCS) was organized in 1959 "to seek the improvement of biology education."[2]

The first project of the BSCS was preparation of materials for courses in beginning biology in "average" high schools. More than 1,000 teachers and 150,000 students used the trial instructional materials.[3] Recommendations from both groups have been considered in the three revised versions of classroom materials now available commercially.[4] To acquire significant knowledge in science by investigation and inquiry, rather than by rote memory, was emphasized. This approach was adopted to achieve the present objectives of American public education, the development of attitudes and skills rather than the knowledge of isolated facts. Recently the memorization of isolated facts has appeared to be impractical because "with each new generation our fund of scientific knowledge increases fivefold."[5]

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[1] Paul DeHart Hurd, Biological Education in America 1890-1960 (Biological Sciences Curriculum Study Bulletin No. 1. Washington: American Institute of Biological Sciences, 1961), p. 135.

[2] BSCS Newsletter (No. 17, Boulder, Colorado: University of Colorado, 1963), p. 7.

[3] Joseph J. Schwab (ed.), Biology Teachers' Handbook (New York: John Wiley and Sons, Inc., 1963), p. xi.

[4] BSCS Newsletter (No. 19, Boulder, Colorado: University of Colorado, 1963), p. 32.

A handbook, edited by Joseph J. Schwab of BSCS, has been developed for biology teachers to use in adapting materials to a variety of classroom procedures.[6] Included in the handbook are explanations of scientific concepts that have been considered either new or beyond the scope of previous high school biology textbooks. Supplementing the handbook, institutes and films are used to train teachers in this new approach. Teachers are encouraged to obtain special preparation in BSCS because "the emphasis in BSCS courses is very different from that of traditional courses; also much BSCS subject matter is not included in traditional courses and may not have been included in the teacher's academic preparation."[7]

Statement of the Problem.

The purpose of this study was to provide a comparison of the content of a textbook prepared for a modern biology course by the BSCS, *Yellow Version*, and *Modern Biology*, one of the traditional textbooks adopted by the Kansas Textbook Commission.

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[5] Schwab, *op. cit.*, p. xi.   [6] *Ibid.*, 585 pp.

[7] *BSCS Newsletter* (No. 17, Boulder, Colorado: University of Colorado, 1963), p. 13.

Significance of the Problem.

It is hoped that data from this study may be used to reach decisions regarding the adoption of BSCS biology; a survey of the literature revealed only a limited number of comparative studies. This study would indicate concepts that are common to both BSCS and traditional textbooks. The analysis undertaken would indicate the common and unique concepts that teachers using BSCS and traditional textbooks need to understand.

Assumptions and Limitations.

It was assumed that the two textbooks analyzed were representative of "modern" and "traditional" biology textbooks. According to BSCS reports a common content of seventy per cent of the material presented may be observed in the three BSCS versions.[8] Mallinson's report supported the assumption that selecting a representative traditional textbook was possible.[9] Limiting the number of books to be compared seemed advisable to allow a thorough study of the textbooks by the investigator. Although a lack of familiarity with the textbooks created problems in early stages of the comparison, the investigator's lack of experience with the books analyzed should add to the objectivity of the study.

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[8] Hiden T. Cox, "Modern Biology: A Unifying Science, Part II--The AIBS-BSCS Versions," *Journal of Secondary Education*, 39:9-13, January, 1964.

[9] George G. Mallinson, "Reading and the Teaching of Science," *School Science and Mathematics*, 44:148-53, February, 1964.

Only the content of the textbooks was compared to determine the concepts presented in each book. Analyses of factors, other than content, involved in textbook evaluation were considered beyond the scope of this study. No attempt was made to evaluate or compare the emphases or methodology of the textbooks.

Definition of Terms.

Content. Content as used in this study means only the printed text and illustrations. Review questions, additional references and other inclusions were not included in the analysis.

BSCS. BSCS as used in this study means the Biological Sciences Curriculum Study. The abbreviation refers only to the *Yellow Version.*

Traditional or *Conventional.* Traditional or conventional as used in this study means any textbook not compiled under the auspices of the BSCS program; these terms refer to the representative textbook, *Modern Biology.*

LITERATURE REVIEW

The BSCS program has been the topic of many recent publications. The emphases and opinions expressed in these articles have been varied. Publications introducing BSCS have been authored by Cox[1] and Crossland.[2] Sister M. Joan[3] and Weishar and Terry[4] have reported their experiences with BSCS programs in the classroom. The educational objectives and philosophy of BSCS concerned Fowler[5] and Weaver.[6] Renner believed that conventional courses in science should provide, as BSCS does, true scientific experiences for students.[7] Renner also was convinced that the responsibility for providing scientific experiences rested with the classroom teacher. Realizing that learning experiences are provided by the teaching methods employed by the teacher, Inlow has stated that "a triangular relationship exists among the learner, teaching method, and subject-matter content."[8]

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[1] Cox, *op. cit.*

[2] Richard W. Crossland, "The American Biological Science Curriculum Study," *The American Biology Teacher*, 26:348-53, May, 1964.

[3] Sister M. Joan, "Chemistry Approach to Biology," *School Science and Mathematics*, 44:101-06, February, 1964.

[4] W. J. Weishar and R. E. Terry, "Our First Year Under BSCS," *The American Biology Teacher*, 26:345-46, May, 1964.

[5] H. Seymour Fowler, "Modern Biology-For Whom?", *The American Biology Teacher*, 25:4, January, 1963.

[6] Richard L. Weaver, "BSCS Plus," *The American Biology Teacher*, 25:404, October, 1963.

[7] John W. Renner, "Why Change Science Teaching?", *School Science and Mathematics*, 64:413-20, May, 1964.

[8] Gail M. Inlow, *Maturity in High School Teaching* (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1963), p. 49.

Teacher Preparation.

Burnett has reviewed the work of several investigators that have studied relationships between academic science preparation and enthusiastic interest in teaching science courses.[9] He reported that all investigators indicated a positive correlation between the relationships studied. Burnett stated that

> "Normative studies, particularly those designed to determine college scientific and pedagogic credits earned by science teachers, continued to appear in quantity. There is little reason for the continued plethora of such studies until modifications in college programs and in state certification standards are devised and enforced. As it is, one unfortunately knows what to expect before the data are collected."[10]

A review of literature in education revealed that other educators, not involved with BSCS biology, were also convinced that adequate teacher training is necessary for successful classroom instruction. At the 1958 Bowling Green Conference,[11] Randall M. Whaley of the National Academy of Sciences-National Research Council stated that "without adequate numbers of inspiring well-informed teachers, fully prepared to meet their responsibilities in our schools, we cannot hope for long to meet successfully the challenges of a changing world."[12]

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[9] R. Will Burnett, "Academic and Professional Preparation of Science Teachers," Review of Educational Research, 34:313, June, 1964.

[10] Ibid.

[11] The NCTEPS of NEA worked with a steering committee of eight co-sponsoring organizations to conduct the first large scale national effort to involve representatives of all areas of education from kindergarten through graduate school.

[12] G. K. Hodenfield and T. M. Stinnett, The Education of Teachers (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1961), p. 21.

The Ford Foundation described the "hidden deficiency" of teacher education as "teachers who have the proper degrees but whose training has been outmoded or inadequate.[13]

Textbooks.

The value of the textbook for student learning has been recognized. The American Textbook Publishers Institute stated that "the author of a textbook. . . can never fully direct the teaching that needs to be done to provide for individual differences."[14] "The modern textbook is more and more thought of as an 'assistant teacher in print'."[15] In a *History of American Schoolbooks* Carpenter wrote about the schoolbook in education today.

> "Within our era the printed text has been supplemented here and there by inventions such as motion pictures, radio, phonograph recordings, and television, and we hear a great deal about these things. We may well ask whether these new inventions will displace the schoolbook. There seems to be but one answer-as remarkable as the inventions are, and notwithstanding their impact upon our time, they have made no decisive headway as an accepted and integral portion of the educational system as to threaten the displacement of the book."[16]

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[13] *The New Teacher: A Report on Ford Foundation Assistance for New Patterns in the Education of Teachers* (New York: Ford Foundation, 1962), p. 6.

[14] *Textbooks in Education* (New York: The American Textbook Publishers Institute, 1949), p. 7.

[15] *Ibid.*, p. 3.

[16] Charles Carpenter, *History of American Schoolbooks* (Philadelphia: University of Pennsylvania Press, 1963), p. 278.

Textbook Evaluation.

The problem of textbook selection has been the concern of many investigators. Gertrude Whipple's study of Procedures Used in Selecting School Books was published in 1936;[17] by 1942 John Clement had prepared materials for extensive analysis and selection of textbooks.[18]

In 1964 Mallinson reported working with published material in relation to reading problems in science teaching. Factors considered were content, vocabulary load, sentence structure, illustration, interest level, and supplementary materials. Mallinson stated that although materials may have different emphases, organization, and factors related to reading, content was ninety per cent the same in all books published within two or three years of one another. He believed that illustrations should extend reading material and/or develop additional concepts rather than duplicate the text. Flesch, Lorge, and Dale-Chall reading formulae were recommended by Mallinson to analyze sentence structure; both technical and non-technical terms were recognized as important in the determination of vocabulary load. Interest level was determined by the contemporary character of topics and by style.[19]

Ten biology textbooks were analyzed by Blanc to determine topics and areas receiving major emphasis. The emphasis given each topic was indicated numerically as follows:

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[17] Gertrude Whipple, Procedures Used in Selecting School Books (Chicago: University of Chicago Press, 1936), 175 pp.

[18] John Addison Clement, Manual for Analyzing and Selecting Textbooks (Champaign, Illinois: The Garrard Press, 1942), 119 pp.

[19] Mallinson, op. cit.

3--topic covered in great detail
2--topic covered adequately
1--topic covered briefly

Ninety-two topics were ranked from the ten books; the most important areas appeared to be conservation of natural resources, study of the human body, study of flowering plants, and genetics and eugenics. No attempt was made to analyze the effectiveness of the presentation, the accuracy of the material or other factors used to judge textbooks.[20] Sanders also analyzed traditional biology textbooks; he used score cards to evaluate the qualities of the textbooks.[21]

Studies to compare "traditional" and "modern" approaches in science teaching have been reported by a limited number of investigators. Rainey compared results obtained from two groups of high school chemistry students. One group used the CHEM Study Curriculum materials; conventional materials and procedures were used by the second group. There were no significant differences reported between the mean test scores of the experimental groups at the beginning or at the end of the school year.[22] Bennett compared a chemistry textbook adopted by the state of Mississippi with the text prepared by the Chemical Bond Approach Committee (CBA). The types of topics, topic placement and organization were included in the analyses. State adopted textbooks were judged inadequate in their approaches to the teaching of chemistry when compared with the Chemical Bond Approach. Theoretical concepts appeared to be used more extensively in the CBA text than in traditional textbooks.[23]

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[20] Sam S. Blanc, "A Topical Analysis of High School Biology Textbooks," Science Education, 41:205-09, April, 1957.

[21] Alexander Sanders, "An Analysis of Selected Textbooks for a High School Biology Course" (unpublished Master's thesis, Tennessee Agricultural and Industrial State University, Nashville, 1961).

[22] Robert G. Rainey, "A Comparison of the CHEM Study Curriculum and a Conventional Approach in Teaching High School Chemistry," School Science and Mathematics, 64:539-44, June, 1964.

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[23] John V. Bennett, "The Extent to Which High School Chemistry Textbooks Adopted by the State of Mississippi Compare with the C.B.A. Textbook" (unpublished Master's thesis, Atlanta University, Atlanta, Georgia, 1963), p. 71.

DESIGN OF THE STUDY

The BSCS *Yellow Version* and *Modern Biology* were the sources of data for this study. The content of each textbook was read carefully and outlined. The following broad areas of study were noted: biology—its approach and history, ecology, microorganisms, flowerless plants, flowering plants, animals, and heredity and evolution. Topics related to a broad area were selected from the first content outlines and were recorded under the appropriate area of study; this information was recorded in tabular form. Page numbers were recorded so the material could be easily located; content was evaluated and a numerical rating recorded to facilitate a complete comparison of content. Evaluation of content was indicated as follows:

3--content included development of concepts of topic,
2--content included concepts of topic without their development,
1--content included few concepts or their development.

General topics in the BSCS text were considered first. The traditional text material was then compared with BSCS content and the recording procedure was repeated. Topics were then added to the area categories that were featured only in the traditional textbook. The total number of topics recorded for each area of study was determined; common and unique topics were noted and the per cent of common and characteristic topics in each broad area and textbook was calculated.

PRESENTATION OF DATA

Table I shows that ninety per cent of the material related to the history and approach of biology was common to both books evaluated. The relation of life and matter, included by BSCS, was not considered in the conventional textbook.

Several ecological concepts, seventy-three per cent, were common to the books analyzed. One of these concepts, conservation, had more space devoted to it in the traditional text than in the BSCS version as Table II indicates. Only the traditional text considered abiotic and biotic factors of environment; concern about the "population explosion" was distinctively BSCS.

The fact that bacteriological technique, soil microbiology and preventive medicine were considered only in the traditional textbook has been indicated in Table III. Both texts included seven other topics, seventy per cent, related to microorganisms.

As indicated in Table IV, the traditional text was characterized by discussions of Lichens, Pteridophytes, and the classification of Algae. The evolution of Algae, of sexual reproduction and of vascular land plants were considered only by BSCS. Fifty-four per cent or seven of the additional concepts related to the flowerless plants were common to both textbooks.

Flowering plants were considered in detail by authors of both texts; Table V shows that seventy-two per cent of the material was common. Concepts in the BSCS text were primarily related to photosynthesis and seed development. The BSCS was unique in their consideration

TABLE I

TOPICS RELATED TO BIOLOGY: ITS APPROACH AND HISTORY*

Textbook	BSCS		Traditional	
Topic	Pages	Rating	Pages	Rating
Biological Questions	3-7	2	14-17	1
Story of Malaria	10-20	3	238-239	1
Methods of Inquiry	44-46	3	1-6	3
Theories of Life's Origin	23-43	3	12-14	1
The Microscope	47-48	2	7-9	3
Cell Theory	55-61	2	31-33	2
Relation of Life and Matter	65-91	3	None	---
Living Chemistry	93-115	3	21-30	2
Cell Physiology	118-138	3	35-49	3
Reproduction in Cells	140-153	3	50-52	2

*Nine of the ten topics or ninety per cent were common to both texts.

TABLE II

TOPICS RELATED TO ECOLOGY*

Textbook	BSCS		Traditional	
Topic	Pages	Rating	Pages	Rating
Organization/Relationships	154-160	2	36,37 423-425	2
Cycles in Nature	161-168	3	80	3
Inter-Relationships	169-176	2	38, 62-64	2
Major Habitats or Climatic Zones	690-705	3	70	1
Abiotic Factors	None	---	66-70 71-73	2
Biotic Factors	None	---	74-76	2
Succession	172-175	3	73-74	2
Man and Food	707-712	2	437-445	3
Man's Increased Numbers	712-713	2	None	---
Soil Conservation	702, 713-714	1	671-683	3
Living Resources— Forest and Wildlife	714-719	1	684-710	3

*Eight of the eleven topics or seventy-three per cent were common to both texts.

TABLE III

TOPICS RELATED TO MICROORGANISMS*

Textbook	BSCS		Traditional	
Topic	Pages	Rating	Pages	Rating
Viruses	181-191	3	564-565	1
Bacteria	192-205	3	104-108	2
Bacteriological Techniques	None	---	109-110	3
Soil Bacteriology	None	---	111	1
Food Bacteriology	222-229	3	110-112	2
Pathogenic Organisms	207-213	2	564-570	3
History of Disease Control	213-215	1	558-564 581-591	3
Immunology	213-216	2	571-575	3
Chemotherapy and Antibiotics	217-222	2	575-579	3
Preventive Medicine	None	---	594-603	3

*Seven of the ten topics or seventy per cent were common to both texts.

TABLE IV

TOPICS RELATED TO FLOWERLESS PLANTS*

Textbook	BSCS		Traditional	
Topic	Pages	Rating	Pages	Rating
Fungi and their importance	231-239	2	113-124	3
Yeasts	239-242	2	117-118	2
Lichens and Symbiosis	None	---	124-125	1
Fossils of Plants	243-245	2	193	1
Radio Dating	243-245	2	540	2
Evolution of Algae	247-250	2	None	---
Evol. of Sexual Reproduction	250-254	2	None	---
Algae and Space Travel	257	2	102	2
Economic Importance of Algae	258-259	1	101-102	2
Classes of Algae	None	---	92-101	3
Nonvascular Plants	260-268	3	126-129	3
Evol. of Vascular Land Plants	268-285	3	None	---
Pteridophytes	None	---	130-134	2

*Seven of the thirteen topics of fifty-four per cent were common to both texts.

TABLE V

TOPICS RELATED TO FLOWERING PLANTS*

Textbook	BSCS		Traditional	
Topic	Pages	Rating	Pages	Rating
Adaptations for Photosynthesis	286-288	2	183-186	3
Light and Photosynthesis	288-290	2	189	1
Chlorophyll and Photosynthesis	290-291	2	186-187	2
Carbon dioxide and Photosynthesis	291-293	2	186	1
Water Loss	293-295	2	186	1
Biochemistry of Photosynthesis	295-297	3	188-190	3
Amount of Photosynthesis	297-299	2	None	—
Respiration	None	—	190-192	2
Foods in Plants	None	—	192-193	2
Transpiration	None	—	193-195	2
Seasonal Leaf Influences	None	—	195-198	2
Stems	301-307	3	167-174	3
Roots	307-310	2	146-156	3
Movement and Storage of Materials	310-316	3	158-165 174-176	3
Propagation by Roots and Stems	317-319	1	156-157 176-181	1
Flowers and Reproduction	319-324	2	200-209	3
Fruits and Dispersal	322	1	211-216	3
Seeds and Development	324-335	3	216-226	2

*Thirteen of the eighteen topics or seventy-two per cent were common to both texts.

of the amount of photosynthesis occurring in the world. The traditional text included information about respiration, transpiration, the production of foods in plants, and seasonal influences upon leaf activity; these topics were omitted by BSCS.

Concepts related to animals were numerous and difficult to analyze as Table VI indicates. The life processes, digestion, circulation, respiration, excretion, coordination, protection, locomotion and reproduction, of the Paramecium, Hydra, Planaria, earthworm and man were considered in both textbooks. Other organisms studied briefly included the Ameba, Euglena, jellyfish and grasshopper. The common content was determined to be fifty-two per cent. The BSCS text was characterized by the inclusion of theories of embryo development and cell differentiation. The traditional textbook was unique because it included information about the life processes of animals of many phyla, insect habits and control, radiation and space biology, and alcohol, narcotics and tobacco.

Heredity and evolution were considered in greater detail by BSCS authors. Table VII shows that most of the concepts, eighty-nine per cent, were evident in both books. The cultural evolution of man was a distinct presentation of BSCS.

TABLE VI

TOPICS RELATED TO ANIMALS***

Textbook	BSCS		Traditional	
Topic	Pages	Rating	Pages	Rating
Plants or Animals	337-342	3	54,229	2
Survey of Phyla	358-370	2	77-80	2
Digestion*	380-397	3	447-458	3**
Transportation in Body*	398-406	2	*	*
Respiration and Breathing*	412-418	2	459-469	3**
Excretion*	421-430	2	472-475	3**
Nervous Systems*	433-441	3	492-502	3**
Endocrine Systems*	443-447	2	515-522	3**
Muscles*	455-458	3	49, 431-436	3**
Skeleton*	458-461	1	310-324 425	3**
Reproduction*	462-477	3	*	*
Blood and Abnormalities	400-407 418-420	1	477-484	3
Lymph	408	1	489-490	1
William Harvey	408-410	3	8	1
Locomotion	451-453	2	40	2
Body Forms	450	2	252	2
Reproductive Cycles	477-481	3	402	1
Embryo Development	482-492	3	614-616	1
Theories of Development	494-496	2	None	—
Cell Differentiation	495-503	2	None	—
Paramecium	343-357	3	234-237	3
Hydra*	*	*	246-247	3
Planaria*	*	*	253-254	3
Earthworm*	*	*	258-262	3
Ameba and Euglena	451	1	230-234	2
Sponges	None	—	242-246	2
Jellyfish	452	1	248-249	3
Flukes	None	—	254-255	1
Tapeworms	None	—	255-256	1
Nematodes	None	—	256-258	1
Mollusks	None	—	265-268	3
Echinoderms	None	—	269-271	2
Classifying Arthropods	None	—	272-273	5
Crayfish	None	—	274-279	5
Spiders	None	—	281-283	2
Other Arthropods	None	—	279-281 283	2
Insects—Grasshopper	401, 414, 423	2	285-293	5
Insect Habits	None	—	294-307	3

TABLE VI (continued)

Textbook	BSCS		Traditional	
Topic	Pages	Rating	Pages	Rating
Insect Control	None	---	309-315	3
Fish Vertebrates	None	---	326-340	3
Amphibia--Frog	None	---	342-355	3
Reptiles--Snakes	None	---	357-395	3
Birds	None	---	375-395	3
Mammal Characteristics	None	---	396-414	2
Sense Organs**	None	---	504-515	3
Alcohol, Narcotics and Tobacco**	None	---	525-531	2
Radiation Biology	None	---	533-543	2
Space Biology	None	---	544-555	2

*Materials integrated differently in BSCS but topics considered common.

**In man.

***Twenty-five of the forty-eight topics or fifty-two per cent were common to both texts.

TABLE VII

TOPICS RELATED TO HEREDITY AND EVOLUTION*

Textbook	BSCS		Traditional	
Topic	Pages	Rating	Pages	Rating
Early Genetics and Mathematics	507-525	3	618-628	2
Chromosome Activity	527-547	3	611-614	2
Genes	548-572	3	609-611 628-633	2
Population Genetics	573-587	2	635-654	2
Theories of Evolution	589-610	3	655-665	2
Mechanisms of Evolution	611-632	3	18-19 666-667	2
Origin of Life	633-656	3	13	1
Evolution of Man	657-672	3	418-423	2
Cultural Evolution of Man	674-686	3	None	---

*Eight of the nine topics or eighty-nine per cent were common to both texts.

SUMMARY AND CONCLUSIONS

The purpose of this study was to compare the content of a traditional and BSCS textbook.

Inspection, topical analysis and concept evaluation of topics were used to analyze the two books compared in this study. The percentages of common and unique concepts in the textbooks were based on the total number of topics recognized in a broad study area and in the textbooks.

The 119 topics in the seven broad areas of study were summarized as shown in Table VIII. Seventy-seven items or sixty-five per cent were common to both textbooks. The BSCS version contained nine unique topics, seven per cent of the total number of topics. The unique BSCS topics included the "population explosion", the relationship of life to

TABLE VIII

CONTENT IN THE BSCS *YELLOW VERSION* AND *MODERN BIOLOGY*

Area of Study	Sub-Topics		In Common		BSCS Only		Trad. Only	
	No.	%	No.	%	No.	%	No.	%
Biology-Approach and History	10	100	9	90	1	10	-	-
Ecology	11	100	8	73	1	9	2	18
Microorganisms	10	100	7	70	-	-	3	30
Flowerless Plants	13	100	7	54	3	23	3	23
Flowering Plants	18	100	13	72	1	6	4	22
Animals	48	100	25	52	2	4	21	44
Heredity and Evolution	9	100	8	89	1	11	-	-
Totals	119	100	77	65	9	7	33	28

matter, the evolution of sexual reproduction, algae, and vascular land plants. The traditional textbook contained thirty-three characteristic topics, twenty-eight per cent of the topics listed. Soil bacteriology, preventive medicine, space and radiation biology, and the classification of algae were some of the topics listed as characteristic of the traditional textbook.

Data of this study indicated that differences in content of BSCS and traditional textbooks were similar in number to the differences reported by BSCS between the three versions; special teacher training by BSCS did not appear to be justified on the basis of content differences. Common content in the two texts compared in this study was not as great as Mallinson reported in traditional textbooks. Because BSCS has required training in content for adequate teaching, results of this study indicated a need for additional training in content for teachers of traditional biology textbooks.

Results of this study indicated that additional comparison of "traditional" and "modern" programs of study was desirable to distinguish theoretical and real differences in the programs. Methods of in-service training in current biological concepts for all biology teachers should be studied.

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A COMPARISON OF THE CONTENTS OF SELECTED BSCS AND TRADITIONAL TEXTBOOKS

by

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B. S., Kansas State University, 1960

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The purpose of this study was to compare the content of the BSCS *Yellow Version* and *Modern Biology* by Moon, Otto, and Towle, a traditional textbook.

A common content of seventy per cent in the three BSCS versions has been reported by BSCS; the *Yellow Version* was selected as representative of the BSCS books. In traditional textbooks published within two or three years of one another a common content of ninety per cent has been reported also. A representative traditional textbook, *Modern Biology* by Moon, Otto, and Towle, was selected for this comparative study.

The textbooks for this study were carefully read and outlined topically. Seven broad areas of study were noted, the history and approach of biology, ecology, microorganisms, flowerless plants, flowering plants, animals, and heredity and evolution. General topics in each area were listed to facilitate a page by page comparison of the concepts presented in the textbooks. Content was evaluated by a simple numerical rating system; page numbers were recorded so that concepts related to the topics could be located easily. The percentages of common and unique materials were calculated for the broad areas of study and the textbooks.

A total of 119 topics was recorded from the textbooks. Sixty-five per cent of the topics was common to both books. Seven per cent of the topics was characteristic of the BSCS version and twenty-eight per cent of the total number of topics was considered only in the traditional textbook. The percentages of common materials in the seven broad study areas ranged from fifty-two per cent to ninety per cent.

Results of this study indicated that common content of a BSCS and a traditional textbook was similar. Data from this study revealed that the common content of the textbooks compared was similar to the previously reported common content of the three BSCS versions. Content differences could not justify special teacher training in BSCS biology. The data of this study indicated that training in current biological concepts would be important to biology teachers using either BSCS or traditional textbooks.